

DETAILED ACTION

1. Applicant's submission, filed June 18, 2009, has been carefully considered. Examiner has modified the previous prior art rejection based on the amended claims. Examiner has also added new claim objections, and rejections under 35 U.S.C. 112 in response to the claim amendments.

Claim Objections

2. Claim 36 is objected to because of the following informalities: Claim 36 is an independent claim, and therefore should begin with --A method--. Also, examiner suggests adding the word --an-- between "using" and "apparatus" in line 1. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-10 and 13-43 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Each of independent claims 1, 35, and 36 now recites, in some form, that an "apparatus" comprises at least one vane and at least two blades. These claims also state that a "clamp" clamps the "apparatus" to a drill string. However, according to the

examiner's understanding, the clamp (which is labeled '9' in the drawings) merely clamps onto the end (6g) of the bearing portion (6) of the sleeve, in order to maintain the axial position of bushing (7) on the bearing portion. So the "clamp" does not really clamp the "apparatus" (which comprises both the vane and the blades) onto the drill string. It is the examiner's understanding that sleeve (5) is actually what clamps onto the drill string. However, even the sleeve does not actually clamp *both* the vane and the blades onto the drill string. The sleeve can only clamp the vanes to the drill string, since the vanes are on the sleeve. The blades are not "clamped" onto the drill string by anything other than the bushing (7). The bushing is clamped onto the bearing portion (6), which is in turn clamped onto the drill string. Examiner is unaware of the disclosure of any clamp which is capable of clamping both the vane and the blades to the drill string.

In summary, what is claimed in the independent claims is inconsistent with what is disclosed in the drawings and specification. Appropriate clarification and correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-7, 10, 13-15, 20-22, 24, 26-33, 35-42, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Yancey (US 2,794,617).

With regard to claim 1, Yancey discloses an apparatus for mobilizing drill cuttings in a well, the apparatus comprising at least one vane (42), at least two blades (see Exhibit A, attached to this Office Action) defining at least one fluid conduit (54) between adjacent blades, the blades and vane being rotatable relative to one another (column 3, lines 41-50) and a clamp (the combination of elements 14 and 22) configured to clamp the apparatus to a drill string (10) in use (the elements 14 and 22 vertically sandwich the vanes and blades between shoulders 58 and 34, thereby indirectly clamping the vanes and blades to drill string 10).

With regard to claim 2, the blades are configured to create a pressure difference in a fluid flowing through the at least one fluid conduit.

With regard to claim 3, Yancey discloses a sleeve adapted to fit over a drill string in the well (see Exhibit A).

With regard to claim 4, the vanes are located on the sleeve (see Exhibit A).

With regard to claim 5, the blades project farther than the vanes (see Exhibit A).

With regard to claim 6, the blades are mounted on a bushing (see Exhibit A) which is rotatably mounted on the sleeve, in the sense that it abuts the lower end of the sleeve.

With regard to claim 7, the blades are parallel to the axis of rotation.

With regard to claim 10, both elements 14 and 22—which form the clamp—are annular in shape, and in an indirect manner attach the sleeve to the drill string 10.

With regard to claim 13, Yancey teaches that the vanes (42) rotate with the drill string (column 3, lines 41-50).

With regard to claim 14, the vanes are part of a turbine which creates thrust.

With regard to claim 15, the blades appear to have at least one axis of asymmetry.

With regard to claim 20, the bushing (see Exhibit A) is rigid.

With regard to claim 21, the sleeve is annular.

With regard to claim 22, the vanes are integral with the annular sleeve (see Exhibit A).

With regard to claim 24, the blades are integrally formed with the bushing (see Exhibit A).

With regard to claim 26, the sleeve has an axis of rotation and the vanes are parallel to it.

With regard to claim 27, the vanes form a scoop (see Figure 5).

With regard to claim 28, the vanes form at least part of a sinusoidal shape (see Figure 5).

With regard to claim 29, one end of the vane is circumferentially spaced from the other end because of the curvature of the vanes seen in Figure 5.

With regard to claim 30, the blades are provided on a bushing (see Exhibit A), and are offset *radially* from the axis of rotation of the bushing. The vanes are offset in an *axial* respect from the axis of rotation of the apparatus, therefore the directions of offset of the vanes and blades are opposite.

With regard to claims 31 and 32, the upper surface of each vane is concave, and the upper surface faces the direction of rotation.

With regard to claim 33, the upper end of each vane has a greater radius of curvature than the lower end.

With regard to claim 35, Yancey discloses the limitations of this claim as applied to claim 1, where the claimed "tubular" corresponds to numeral 10 in Yancey.

With regard to claim 36, the method of using Yancey's device comprises the claimed steps.

With regard to claim 37, Yancey teaches configuring the blades to create a pressure difference in fluid flowing through at least one fluid conduit defined by two at least two blades (column 3, lines 50-65).

With regard to claim 38, Yancey teaches providing the vane (42) on a sleeve (see Exhibit A).

With regard to claim 39, the blades are provided on a bushing (see Exhibit A) which is rotatably mounted with respect to the sleeve, since it abuts the lower end of the sleeve and rotates relative to it.

With regard to claims 40 and 41, the vanes are fixed to the drill string, and rotate with the drill string (column 3, lines 40-51).

With regard to claim 42, the blades also centralize the drill string (column 3, lines 40-51).

With regard to claim 44, Yancey discloses an apparatus for mobilizing drill cuttings in a well, the apparatus comprising a sleeve (32) adapted to fit over a drill string in the well (in the sense that sleeve 32 is positioned vertically "over" or "above" the lower portion of drill string 10), and at least one vane (42) provided on the sleeve, at

least two blades (see Exhibit A) mounted on a bushing (see Exhibit A) that is rotatably mounted on the sleeve (column 3, lines 41-50), wherein the blades define at least one fluid conduit between adjacent blades, the blades and vane being rotatable relative to one another (column 3, lines 41-50), wherein the sleeve has a bearing region (i.e. the outer diameter of sleeve 32) and the bushing closes around the bearing region of the sleeve.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 8, 9, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yancey in view of Zublin (US 2,005,767).

With regard to claims 8 and 9, Yancey fails to disclose the blades also being offset so that they extend helically around the bushing, nor does Yancey disclose a specific angle of 3-10 degrees.

Zublin discloses an agitating assembly (see Figure 11) which comprises relatively rotating vanes and blades which are axially offset and extend helically.

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified Yancey to have included axially offset, helically extending blades, as Zublin states that this configuration allows the agitator to "abruptly change the direction of the upwardly moving oil stream as the stream strikes these successive vanes" thus enhancing the suspension of drill cuttings within the oil (page 5, column 2, lines 40-43). Furthermore, though Zublin appears to disclose an angle greater than 3-10 degrees, it would have been considered obvious to dispose the blades at whatever angle was necessary, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

With regard to claims 16 and 18, in the combination of Yancey and Zublin, the blades (135) are shaped like foils, so that the fluid conduits defined between adjacent blades on the bushing change in profile between a first end proximal to the drill bit and a second end distal from the drill bit, and the blades appear to have an hourglass shape (specifically when seen straight-on in Figure 11 of Zublin).

With regard to claims 17 and 19, in the combination of Yancey and Zublin, Zublin's fluid conduits are narrower at the proximal end and appear to become narrow again at the distal end. Also, the blades appear to simply have a constant width from root to tip. However, it would have been considered obvious to have provided blades of the claimed shape, as opposed to the shapes shown by Yancey in view of Zublin, since

it has been held that a change in the shape of a prior art device is a design consideration within the level of ordinary skill in the art. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

9. Claims 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yancey.

With regard to claims 23 and 25, Yancey shows both the vanes and blades being integral with the sleeve and the bushing, respectively.

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have made the vanes and blades of Yancey separable and modular, rather than integral, to increase the ease of repair of the device, and because it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

10. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yancey in view of Shizawa (JP62101149).

Yancey fails to disclose the blades comprising a notch.

Shizawa discloses a mixing/agitating device having a blade (14) comprising multiple notches (13).

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have provided the blades of Yancey with notches, as Shizawa states that "turbulences and divisions are generated by the flow caused by

respective notches and blades...to mix and agitate the fluids more effectively" (see Abstract).

11. Claims 1, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yancey.

Yancey discloses an apparatus for mobilizing drill cuttings in a well, the apparatus comprising at least one vane (42), at least two blades (see Exhibit A) defining at least one fluid conduit (54) between adjacent blades, the blades and vane being rotatable relative to one another (column 3, lines 41-50).

Yancey fails to disclose the vanes being mounted on a clamp which attaches to the drill string.

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have formed the sleeve on which the vanes are mounted in Yancey in the form of a hinged clamp, rather than simply a solid annular sleeve, because examiner hereby takes Official Notice that it is notoriously well known in the art to attach clamps having blades to drill strings in order to increase the ease of installation, removal, and repair of those devices (US 6,250,405, US 5,833,019, US 4,796,670, US 4,266,578, US 3,894,780 provide ample evidence of this fact).

Allowable Subject Matter

12. Claim 45 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

13. Applicant's arguments filed June 18, 2009 have been fully considered but they are not persuasive. Applicant has argued that Yancey's sleeve could not be formed into a clamp, because Yancey's sleeve is part of a sub which is attached to a drill string, and therefore must be rigid. Examiner respectfully traverses this argument. It is not the sleeve of Yancey which is part of the drill string, but rather, tubular 32. Therefore, the sleeve could easily be formed into a clamp, since it is merely disposed around the outer diameter of tubular 32.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT E. FULLER whose telephone number is

(571)272-0419. The examiner can normally be reached on Monday thru Friday from 8:00 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer H. Gay can be reached on 571-272-7029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shane Bomar/
Primary Examiner, Art Unit 3676

10/21/2009
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